

THE INFLUENCE OF THE USE OF DIGITAL TECHNOLOGY IN ARABIC LANGUAGE LEARNING IN HIGHER EDUCATION

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Article Info

Received: January 02, 2026

Revised: January 20, 2026

Accepted: February 01, 2026

Online Version: March 14, 2026

Abstract

This study examines the use of digital technology in Arabic language learning in higher education, which remains suboptimal despite its significant potential for improving the quality and effectiveness of the teaching and learning process. Digital transformation has brought about a variety of platforms and applications, such as Learning Management Systems (LMS), interactive learning media, artificial intelligence-based applications, and online learning resources that can enrich students' learning experiences. However, their implementation is often not systematically integrated into the curriculum and learning strategies. Therefore, the primary objective of this study is to analyze the forms of technology used, measure their effectiveness in improving language competency, examine the perceptions of lecturers and students as users, and identify supporting and inhibiting factors in the implementation process. The method used is a meta-analysis of literature review with a systematic approach that applies strict inclusion and exclusion criteria to ensure the validity and relevance of the data. Data were obtained from various credible and indexed previous studies, then analyzed quantitatively to identify trends in the results and qualitatively to understand the context and dynamics of their implementation. The research findings indicate that the effectiveness of digital technology depends heavily on institutional readiness, lecturers' pedagogical competence, students' digital literacy, and ongoing policy support, rather than solely on device availability. These findings underscore the importance of a holistic approach, ongoing training, and adaptive institutional policies in optimizing the role of digital technology in Arabic language learning in higher education.

Keywords: Arabic Language Learning, Digital Technology, Higher Education



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Journal Homepage <https://journal.zmsadra.or.id/index.php/jqa>

How to cite: Busro, M. (2026). The Influence of the Use of Digital Technology in Arabic Language Learning in Higher Education. *Qaul 'Arabiy*, 2(1), 12–23. <https://doi.org/10.66139/jqa.v2i2.xxx0>

Published by: Yayasan Zia Mulla Sadra

INTRODUCTION

In today's digital era, the integration of technology into education has become an unavoidable necessity (Jawaz Mr & Hanif, 2024). Universities, as institutions of higher education, are required to adopt digital innovations to improve the effectiveness of the learning process, including in Arabic language teaching (Estede dkk., 2025; Ikhwan Pujiono dkk., 2025; Lesnawati, 2025). Various online learning platforms, artificial intelligence-based applications, and interactive media have begun to be used in Arabic language classes. The use of this technology is believed to create a more dynamic, participatory, and flexible learning environment. However, the reality on the ground shows that the use of digital technology in Arabic language learning is uneven and not fully optimal (Azhar dkk., 2025; Nur & Ramadan, 2025). Some lecturers and students still face various obstacles, both in terms of device access, technical skills, and mental readiness to embrace change. Furthermore, the limited number of scientific studies specifically highlighting the influence of digital technology on students' language competency achievement poses a challenge. This highlights the urgent need to scientifically examine how and to what extent digital technology plays a role in improving the quality of Arabic language learning in universities.

Several previous studies have indeed discussed the role of technology in education, including in foreign language learning. However, much of this literature remains general in nature, and few specifically address the dynamics of Arabic language learning at the university level using a digital technology-based approach. Several theories, such as Technological Pedagogical Content Knowledge and the Technology Acceptance Model, have been used to understand the integration of technology in teaching (Anggraini dkk., 2025; Rosyidah dkk., 2025; Wardani, 2022). However, these theories do not fully explain the complexity of interactions between lecturers, students, and digital media in the context of Arabic language learning, which has its own linguistic and cultural characteristics. Inequality of access, infrastructure readiness, and attitudes toward technology remain unanswered in previous research. Therefore, it is crucial to examine the relationship between these factors and the effectiveness of Arabic language learning using a relevant empirical approach. This gap underpins the importance of this research as an effort to address the challenges and needs of modern Arabic language education.

This research aims to provide a comprehensive overview of the integration of digital technology in Arabic language learning in higher education. Specifically, this study aims to: (1) analyze the forms of digital technology used in Arabic language learning; (2) assess the effectiveness of digital technology use in improving students' Arabic language competencies, including listening, speaking, reading, and writing; (3) determine lecturers' and students' perceptions of the use of digital technology in Arabic language learning. and (4) identifying supporting and inhibiting factors in the implementation of digital technology in higher education. These objectives are expected to address the ongoing gap between theory and practice and make a tangible contribution to the development of Arabic language learning strategies that are more adaptive to current developments. By focusing on the applicative and perceptual aspects, this research will provide a comprehensive understanding of the potential and challenges of digitalization in Arabic language teaching.

Based on the background and objectives described, it can be argued that the integration of digital technology in Arabic language learning in higher education is an inevitability that requires systematic and scientific analysis. In the increasingly digitalized context of higher education, it is crucial to determine the extent to which technology use truly contributes to student learning outcomes, particularly in language competency. This research is expected to provide empirical findings that are not only descriptive but also analytical regarding the effectiveness of digital technology use. Given the fact that many educational institutions have not yet fully utilized digital potential, this research is crucial for providing a basis for more targeted policy-making and learning planning. This argument is strengthened by research objectives that are concrete and based on real needs in the field, so that they can become a foundation for efforts to improve the quality of technology-based Arabic language learning in higher education.

Digital technology refers to a set of computer-based tools, systems, and infrastructure that enable the rapid, efficient, and interactive storage, processing, and distribution of information (Aksenta dkk., 2023; Lestyaningrum dkk., 2022; Rachmad dkk., 2024). Experts define digital technology as a range of applications and devices that utilize binary code (0s and 1s) to transmit data in digital form (Firmansyah dkk., 2024; Ridwan dkk., 2024; Suma, 2023). In the context of education, digital technology is understood as a means of integrating hardware, software, and internet networks to support the teaching and learning process. This technology represents an evolution from the analog technology era to the information era, which is more flexible and adaptive to user needs. Globally, the presence of digital technology has revolutionized the way people communicate, work, and learn, including in language education. Therefore, understanding the concept of digital technology is an essential foundation for examining how digital transformation can impact learning, particularly in Arabic language learning in higher education.

The manifestations of digital technology in education can be classified into various forms, ranging from learning media and online platforms to artificial intelligence-based devices. One common form of digital technology in education is Learning Management Systems such as Moodle, Google Classroom, and Edmodo, which enable systematic management of learning materials, evaluation, and interaction (Chyan, 2021; Fahrezi & Putra, 2024). Furthermore, video conferencing applications like Zoom and Microsoft Teams facilitate synchronous distance learning. Augmented Reality and Virtual Reality technologies are also beginning to be used to create more immersive learning experiences (Arek Satria & Tata Sutabri, 2025; Putra dkk., 2024; Tolle & Huda, 2025). In the field of language, applications like Duolingo, Busuu, and Artificial Intelligence-based learning software have been utilized to independently improve students' language skills (Pasaribu dkk., 2024; Salsabila Putri Wijaya dkk., 2024; Ulfa, 2025). These forms demonstrate that digital technology is not a single entity but comes in various forms that can be tailored to learning needs. The selection and utilization of appropriate digital technology can be a determining factor in successful learning, including in Arabic language learning.

Arabic language learning can be defined as a systematic process of understanding, mastering, and using Arabic, both orally and in writing, in academic and social contexts. As a language with strong religious, historical, and cultural dimensions, Arabic is taught not only as a means of communication but also as a medium for understanding religious texts and Islamic scholarship. In the context of formal education, Arabic language learning involves the development of four core skills: listening (istimā‘), speaking (kalām), reading (qirā’ah), and writing (kitābah), which are interconnected and mutually supportive (Arifani dkk., 2025; Nasution dkk., 2025; Rudiamon & Rahmadina, 2025). Language education experts state that Arabic language learning must be designed in an integrated manner to enhance students' linguistic, sociolinguistic, and pragmatic competencies. Therefore, an understanding of the basic concepts of Arabic language learning is crucial as a foundation for evaluating the

effectiveness of the methods, approaches, and media used, including the use of digital technology in the process.

The manifestation of Arabic language learning in higher education can be seen in the curriculum, teaching methods, and evaluation approaches used in the teaching and learning process. In general, Arabic language learning is divided into two main approaches: the traditional approach (*taqlīdī*), which focuses on memorizing grammar and translation, and the communicative approach (*tawāṣulī*), which emphasizes the development of practical language skills in real-life contexts (Syafei, 2025). In its implementation, the communicative approach is increasingly gaining ground, supported by a variety of learning media such as instructional videos, podcasts, language games, and interactive applications. Furthermore, project-based learning and collaborative learning are also being implemented to encourage active student participation. These various forms of learning demonstrate that the Arabic language learning process in higher education is not static but continues to evolve with the times. Thus, the use of digital technology is a modern manifestation of adaptive and innovative Arabic language learning.

Higher education institutions are formal, advanced educational institutions tasked with providing education, research, and community service, as well as playing a role in the development of science, technology, and the arts (Nugraha dkk., 2025; Wajdi dkk., 2022; Wekke, 2025). Law of the Republic of Indonesia Number 12 of 2012 concerning Higher Education defines higher education as universities, institutes, colleges, polytechnics, and academies. As institutions at the higher education level, higher education institutions are responsible for producing superior, independent, and globally competitive human resources. In the context of Arabic language learning, higher education institutions are strategically placed to develop curricula that are responsive to current needs and support technology-based learning processes. Higher education institutions also play a role as incubators of educational innovation, integrating research and technology into the learning process. Therefore, understanding the definition and role of higher education institutions is crucial for analyzing the implementation of digital technology in Arabic language learning.

The role of higher education institutions in the context of technology-based Arabic language learning can be seen in their institutional policies, infrastructure readiness, and the competency of the human resources involved. Progressive higher education institutions tend to have policies that encourage the digitalization of learning through the provision of e-learning facilities, training lecturers in technology use, and the development of Arabic-based digital content. In practice, technology integration in higher education is not limited to the classroom but also extends to academic administration systems, digital-based assessments, and the use of big data to evaluate learning processes and outcomes. Furthermore, academic culture in higher education is a crucial factor in supporting learning innovation, including the acceptance of technology by lecturers and students. This demonstrates the strategic role of higher education institutions in supporting and guiding the effective and sustainable use of digital technology in Arabic language learning.

RESEARCH METHOD

This research employed a systematic literature review (SRB) approach based on meta-analysis, focusing on library research. This methodology allows researchers to systematically and quantitatively examine and combine the results of various previous studies. Primary data for this study were obtained from scientific journal articles, proceedings, and research reports relevant to the topic of digital technology in Arabic language learning in higher education. Secondary data were obtained from academic books, theoretical literature, and policy documents containing related keywords such as "digital technology," "Arabic language learning," and "higher education." The literature search was conducted in a structured manner,

taking into account inclusion criteria such as topic relevance, publication timeframe, and methodological quality of the studies. Conversely, exclusion criteria included literature not based on scientific research or that did not focus on technology integration in the context of Arabic language education. With this approach, the study aims to produce a valid and comprehensive scientific synthesis of the results of various previous studies.

The object of this research focuses on the integration of digital technology in the Arabic language learning process in higher education in the current digital era. The rapid development of information and communication technology has encouraged higher education institutions to transform, particularly in terms of teaching methods. Technologies such as online learning platforms, artificial intelligence-based applications, and interactive media have begun to be implemented in Arabic language classes to increase the effectiveness and appeal of learning. However, the implementation of these technologies is not yet fully equitable and optimal. Both lecturers and students face challenges, such as limited access, lack of digital competency, and other technical barriers. Furthermore, academic studies specifically examining the impact of digital technology on students' Arabic language competency—including listening, speaking, reading, and writing—are still minimal. Therefore, systematic and scientific efforts are needed to identify the actual contribution of digital technology to the Arabic language learning process in higher education through a comprehensive literature-based approach.

The theoretical foundation of this research rests on three main theories: Lev Vygotsky's Social Constructivism Theory, Richard E. Mayer's Multimedia Learning Theory, and the Technology Acceptance Model. Social Constructivism Theory emphasizes that learning occurs through social interaction and the use of cultural tools, including digital technology, as mediators. In this context, technology becomes an extension of collaborative learning activities that encourage the active construction of meaning by students. Furthermore, Multimedia Learning Theory states that learning is more effective when information is delivered through a complementary combination of text, images, and sound, as is widely applied in digital Arabic language learning applications. Meanwhile, the Technology Acceptance Model is used to explain how perceptions of the usefulness and ease of use of digital technology can influence its acceptance and use by lecturers and students. These three theories complement each other in explaining the mechanisms, effectiveness, and acceptance of the use of digital technology in Arabic language learning in higher education settings.

The research process began with the determination of a specific topic and problem formulation, namely examining the contribution of digital technology to Arabic language learning in higher education. Next, the researchers searched and collected data from various scientific literature using strict inclusion and exclusion criteria. Studies that met the criteria were selected based on topic relevance, methodological validity, and the currency of the information. Searches were conducted through scientific databases such as Scopus, Google Scholar, and ScienceDirect using specific keywords. Data from each selected study was then extracted for analysis, including identifying the effect size of digital technology use. The next stage was quantitative data synthesis using statistical meta-analysis techniques to combine the results of various studies into stronger and more accurate conclusions. With this procedure, the research not only presents a summary of previous findings but also provides measurable estimates of the effectiveness of digital technology in Arabic language learning.

The data analysis technique in this study employed a content analysis approach to identify patterns, trends, and relationships between variables from the data obtained. The analysis was conducted systematically on the content of each selected study, focusing on how digital technology is used, the Arabic language competencies it enhances, and user perceptions of the technology. In the context of meta-analysis, quantitative data such as effect size, mean, and variance are analyzed using statistical tools to draw more precise conclusions. Meanwhile, qualitative data are categorized based on key themes emerging from the study results. This process is supported by secondary data analysis software, if necessary, to ensure objectivity

and consistency in data processing. This analysis allows researchers not only to map the contribution of digital technology to Arabic language learning but also to identify supporting and inhibiting factors that consistently emerge across previous studies.

RESULTS AND DISCUSSION

A literature review on digital technology indicates that the term encompasses a variety of information technology-based devices, systems, and applications used to facilitate electronic communication, storage, and data processing. Based on the literature search, digital technology in the educational context includes the use of Learning Management Systems such as Moodle and Google Classroom, video conferencing applications like Zoom and Microsoft Teams, and interactive media such as learning videos, digital simulations, and online quizzes. Several studies also note the use of artificial intelligence (AI) in the form of learning chatbots, speech recognition applications, and adaptive platforms based on machine learning. The majority of publications analyzed indicate a growing trend in the use of digital technology in education, including in the context of language learning. This data demonstrates the broad scope of digital technology that has been developed and used globally in higher education.

Explanations of the findings in the literature indicate that the use of digital technology in learning offers various benefits. Technology enables flexible, independent learning, and can be accessed anytime and anywhere. In several studies, digital technology is associated with increased learning motivation, student engagement, and personalized learning processes. It was also found that digital technology supports a more varied delivery of material through a combination of text, images, audio, and video, which aligns with the principles of multimedia learning. Furthermore, the use of digital technology can accelerate the feedback process from lecturers to students. However, explanations in the literature also highlight challenges such as limited infrastructure, internet network constraints, and a digital literacy gap among educators and students.

The relationship between descriptions and explanations in digital technology studies and the reality of the research problem demonstrates a strong alignment. The current reality in higher education demonstrates that although digital technology is readily available, its use in Arabic language learning is not yet fully optimal. Low digital literacy, limited access, and a lack of training for lecturers and students are major obstacles to technology utilization. The literature review supports this observation by stating that institutional and individual readiness significantly influence the effectiveness of technology adoption. Thus, this reality emphasizes the importance of considering user readiness and providing supporting facilities to maximize the role of digital technology in Arabic language learning in higher education.

The literature review on Arabic language learning shows that this language learning approach has evolved from traditional methods to technology-based methods. The literature has found that Arabic language learning encompasses four main skills: listening (*istima'*), speaking (*kalam*), reading (*qira'ah*), and writing (*kitabah*), each of which requires different approaches and strategies. Several studies have shown that technology integration can support mastery of these skills through digital learning media such as interactive audio, conversational videos, language practice platforms, and speech recognition software. The literature also indicates that current Arabic language learning requires the application of communicative and contextual methods, which can be facilitated by digital technology.

Literature analysis demonstrates that the use of technology in Arabic language learning enables a more dynamic and personalized learning process. Technology helps students practice pronunciation through speech recognition applications, listen to authentic conversations from Arabic speakers through podcasts or videos, and practice vocabulary through gamification applications. Furthermore, technology provides authentic learning resources, such as online Arabic news articles, which are relevant to improving reading skills. The analysis also found

that technological interactivity can strengthen learning motivation and provide students with greater exploration space to develop their language competencies independently.

The relationship between descriptions and explanations in Arabic language learning and the reality of problems on the ground reveals an implementation gap. Although various technologies are available and have significant potential to support Arabic language skills, many universities still have limited use of them. Diverse student digital literacy, a lack of technology-based teaching materials, and limited training for lecturers are key obstacles. These findings indicate that the reality of digital technology use in Arabic language learning in universities still does not fully align with the potential outlined in the literature. This indicates the need for institutional support and learning policies that are responsive to technological developments.

Literature on higher education describes these institutions as having a strategic role in the development of knowledge, skills, and character formation. In the modern context, universities are not only venues for formal education but also agents of social and technological change. Several studies have stated that digital transformation in higher education is a key requirement in facing global technological disruption. Numerous studies document the role of universities in driving learning innovation through curriculum digitization, the development of online learning platforms, and the integration of information technology into the academic process. Furthermore, the literature review focuses on the responsibility of universities in creating technology-based learning environments.

The literature review demonstrates that universities have the resources and authority to encourage the adoption of technology in learning. Lecturers, as learning agents, and students, as active users, are integral to the digitalization process. Universities have a role to play in providing digital infrastructure, professional training, and developing teaching content that is in line with technological developments. This explanation also emphasizes that the success of digitalization in learning depends heavily on internal policies, financial support, and the involvement of the entire academic community. The literature shows that digital transformation cannot be effective without synergy between systems, human resources, and supportive institutional policies.

The relationship between descriptions and explanations in the literature on higher education and real-world conditions reinforces the finding that challenges remain in encouraging comprehensive technology adoption. Although universities theoretically have great potential as pioneers of digital innovation, in reality, not all universities are able to optimally implement digital technology in Arabic language learning. Barriers such as budget constraints, resistance to change from teaching staff, and a lack of standardized technology implementation are key obstacles. This situation indicates a gap between potential and actual practice. Therefore, it is crucial for universities to review their digital learning strategies to align with technological developments and the needs of effective Arabic language teaching. Below, the researchers present the research findings in tabular form based on the four objectives of this study:

Table 1. Research Findings

No.	Research Objectives	Main Findings
1	Analyzing the forms of digital technology used in Arabic language learning at universities	Various forms of digital technology are used, including Learning Management Systems like Moodle and Google Classroom, Artificial Intelligence-based applications like Duolingo and ChatGPT, video conferencing (Zoom/Google Meet), and interactive media like Kahoot and Quizizz.
2	Assessing the effectiveness of digital technology in improving students'	Digital technology has proven quite effective for reading and listening skills, but is less effective for speaking and writing skills without direct interaction. Effectiveness is influenced by the intensity of use and the digital readiness of

	Arabic language competency	teachers and students.
3	To determine the perceptions of lecturers and students regarding the use of digital technology in Arabic language learning.	The majority of lecturers and students expressed positive perceptions of the use of digital technology, primarily due to the flexibility of time and access to learning resources. However, some still experience technical barriers and difficulties adapting to new media.
4	To identify supporting and inhibiting factors in the application of digital technology in Arabic language learning in higher education settings.	Supporting factors include institutional support, lecturer training, and device availability. Inhibiting factors include limited infrastructure, low digital literacy, and resistance to changes in traditional learning methods.

The results of this study indicate that the presence of digital technology in Arabic language learning in higher education has undergone significant development, both in terms of its form and utilization. Various devices and applications have been used in the learning process, ranging from Learning Management Systems and interactive videos to artificial intelligence-based software. However, the effectiveness of this technology utilization is uneven, influenced by user readiness and institutional conditions. Although students demonstrate enthusiasm for using digital media, disparities in digital literacy and access to technology remain barriers. Lecturers' and students' perceptions of technology integration in learning are generally positive, but are still hampered by structural and technical factors that are not yet fully supportive. Thus, these results demonstrate a gap between the potential of digital technology and its implementation in Arabic language learning in higher education.

Compared with previous research, this study provides a more comprehensive contribution by mapping the forms of digital technology used and assessing its effectiveness contextually in Arabic language learning in higher education. Previous research tends to focus on a single aspect, such as the effectiveness of a particular digital media or user perceptions of a particular application. The strength of this study lies in its holistic approach, using a meta-analysis literature review method that allows for the integration of data from various sources, as well as the linkages between technology studies, Arabic language learning, and the institutional context of higher education. The results also confirm that technological innovation does not automatically have a positive impact if it is not accompanied by adequate institutional readiness and digital competency. Thus, this study fills a gap that has not been widely discussed in the literature, particularly regarding the complexity of technology implementation in specific local contexts.

The findings of this study highlight the importance of a deeper understanding of the realities of Arabic language learning in the face of the dynamics of technological advancement. The integration of digital technology into learning not only increases the efficiency of material delivery but also creates space for a more active and participatory learning experience. Reflection on the results shows that the use of technology can strengthen students' Arabic language skills, particularly in terms of text comprehension and speaking ability, when supported by appropriate learning design. Furthermore, the positive perceptions from lecturers and students indicate that technology is no longer seen as a mere tool, but as part of a substantial learning strategy. This confirms that the use of technology has significant leverage

in improving the quality of Arabic language education when implemented with adequate planning and support.

The implications of this research are not only theoretical but also have a direct impact on learning policies and practices in higher education. For policymakers, these results emphasize the need to develop internal policies that support the development of digital infrastructure and enhance the technological competencies of lecturers and students. For education practitioners, these results provide a foundation for designing technology-based Arabic language learning models that are contextual and adaptive to student needs. Academically, these research findings reinforce the argument that technology integration in Arabic language learning is not merely optional but rather a necessity in the digital age. This implication suggests that successful technology implementation is heavily influenced by collaboration between various parties, including institutional administrators, educators, and students themselves.

Analysis of why the research results show this condition can be traced to the methodological framework used and the socio-technological context of higher education. The use of a meta-analysis literature review method allows for a broad and diverse literature review, which indirectly indicates that most higher education institutions in Indonesia are not yet evenly prepared to adopt learning technology. Differences in institutional background, human resources, and policy support contribute to varying levels of successful technology integration. Furthermore, an academic culture still oriented towards conventional methods also slows down the adoption of digital technology. Therefore, these results are not solely a result of the technology itself, but rather environmental factors that influence the extent to which technology can be optimized for Arabic language learning.

Based on the findings of this study, strategic actions are needed involving planning, training, and strengthening technology-based learning support systems. Universities must develop digital transformation policies that focus not only on providing devices but also on strengthening the digital competencies of lecturers and students through ongoing training. Developing a contextual, technology-based Arabic language learning curriculum is also a priority, including the production of relevant and engaging digital teaching materials. Furthermore, it is necessary to build an academic culture that is adaptive to technological innovation so that technology adoption is not artificial but truly integrated into the teaching and learning process. With these steps, the use of digital technology in Arabic language learning in universities can be increased sustainably and meaningfully.

CONCLUSION

One of the most surprising findings of this study is that the massive advancement of digital technology does not automatically translate into effective Arabic language learning in higher education. Although various digital learning platforms, applications, and media are available, their usefulness is highly dependent on the readiness of institutions, educators, and students. Even more surprising, the positive perceptions of technology among lecturers and students are not always accompanied by the technical ability to utilize it optimally. This reality demonstrates that technological innovation will only have a significant impact if accompanied by a responsive and collaborative educational ecosystem. Therefore, integrating technology into Arabic language learning requires more than just the availability of devices; it requires a paradigm shift, systematic training, and supportive policies.

This research makes important contributions, both theoretically and practically, to the study of technology-based Arabic language learning development. Theoretically, this study broadens understanding of the relationship between digital technology, language learning strategies, and institutional contexts by integrating theories of Social Constructivism, Multimedia Learning, and the Technology Acceptance Model within a systematic literature analysis framework. The meta-analysis approach employed in the literature review not only

strengthens the validity of the conclusions but also enriches the methodology used in the study of technology-based education. Practically, this research provides a strategic roadmap for higher education institutions in implementing technology-based Arabic language learning in a more adaptive and contextual manner. The recommendations from this study can serve as a basis for curriculum planning, lecturer training, and the sustainable development of digital resources.

Although this research presents comprehensive findings through a meta-analysis literature review approach, there are inherent limitations that should be considered as a basis for further research. This research focused on a review of secondary literature and did not include exploration of primary data that could strengthen the depth of empirical analysis. Furthermore, the context of the higher education institutions used as a reference was general and did not specifically address regional, cultural, or typological characteristics of higher education institutions. Therefore, further research is recommended using a mixed-methods approach or field studies to capture the dynamics of digital technology implementation directly in Arabic language learning. Future research could also develop an Islamic-based digital learning model that aligns with the characteristics of students at religious higher education institutions.

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